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ABSTRACT

This research study deals with the relationships of personality and intelligence to English school achievements in the seventh grade of Finnish secondary school. Emphasis is placed upon student factors in learning and teaching a foreign language, particularly upon those student variables which the teacher can influence. A literature review summarizes previous studies of personality and foreign language learning and previous studies of intelligence and foreign language learning. The purposes of the exploratory field study are described: to discover significant variables in the field situation; identify relationships between variables; and, lay a foundation for more systematic testing of related hypotheses. Results of the study and analysis of the data are supportive to these goals. (SHM)

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ENGLISH SCHOOL ACHIEVEMENTS AND SOME STUDENT CHARACTERISTICS I

On the Relationships of Personality and Intelligence Variables to English School Achievements

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I INTRODUCTION

One of the central areas of applied educational research is the study of school achievement and the functions, in terms of which it can be described (Niskanen 1968). Of the studies of school achievement carried out in our country very few have dealt with some particular subject in senior secondary school. However, the reform of senior secondary school and the possible abolition of school leaving examination make it necessary to carry out research on the subjects that are studied there. This is especially true of foreign languages. For many years there have been attempts to reform the school leaving examination of foreign languages, because a very limited area (practically only translation) of foreign language skills is tested in it. The reform is rendered difficult, among other things, by the fact that there is no empirical knowledge of the factors related to foreign language school achievement of Finnish students.

The purpose of this study is to deal with the relationships of personality, intelligence, motivation and auditory ability to English school achievements in the seventh grade of Finnish secondary school. The choice of variables

descriptive of school achievements was suggested by previous studies. The term personality is used here only to refer to temperament traits. The present part of the study deals with the relationships of personality and intelligence to English school achievements; a continuation study will deal with school achievements in terms of motivation and auditory ability. The study is restricted only to student factors, because very little attention has been paid to them, the centre of interest having been the effectiveness of different methods of teaching foreign languages (Chastain 1969b). The so-called audio-lingual method e.g. fails to take individual differences in foreign language learning into account.

The method is based on the faulty assumption that a student can learn a foreign language in the same way as a child learns his native language (Ausubel 1964, Dodson 1967). According to this method learning a foreign language is a mechanical, automatic process which is best promoted by overlearning language structures. The structures are presented in the form of drills which are often artificial and meaningless and seldom have anything to do with normal everyday use of language. No attention is paid to student characteristics, although it depends on the student whether learning occurs or not (e.g. Chastain 1969a, Politzer 1971, Rivers 1964, Spolsky 1966, Stack 1964, Valdman 1970). Let it be generally stated that in studies of foreign language teaching

methods differences have hardly ever been found between the groups taught with different methods (Carroll 1969, Levin 1969, Lindblad 1970); if there have been any differences they have not been found in the total language skill (Scherer et al. 1964). The total language skill means listening comprehension, speaking, reading comprehension, and writing. The Pennsylvania-project can be mentioned as an exception among the studies of foreign language teaching methods (Smith et al. 1968 January, Smith et al. 1968, Smith 1969 September). In the beginning the group taught traditionally showed better achievement. The differences, however, became smaller and disappeared with most criteria during the four years of the experiment.

It is assumed that the so-called methods used by the English teachers of the subjects of this study do not differ much from one another for the following reasons:

- The teachers are about the same age and have got the same kind of teacher training.
- The compulsory school-leaving examination common to all secondary school students influences the way languages are taught.
- The subjects come from one single school, where the English teachers work together very closely.
- All the English teachers of the school were subjects in Casey's study (1968); their responses to the methods profile did not differ much from one another. This gives reason to assume that the method is controlled even with those subjects who do not have the same teacher as they had in junior secondary school.

On account of previous studies (Smith et al 1968 January,

Smith et al 1968 October, Smith 1969 September) it is assumed that differences in the teachers' foreign language skill do not cause differences in students' foreign language skill.

It is hoped that the information given by this research can be used for instance when we have to select students for further studies, when we want to find out possible reasons, why some students fail in their studies or when we want to individualize instruction. Individualized instruction will play an important role in our future school (Mietintö 1970 II A5); It is in harmony with the modern learning theory which emphasizes the importance of the learner rather than that of instruction (Politzer 1971). Special attention is going to be given to those student variables which the teacher can influence, so that recommendations from the results could inferred.

II BACKGROUND OF STUDY

1. On Personality and Foreign Language Learning

The importance of personality in foreign language learning or predicting foreign language learning is often referred to in literature (e.g. Bradley et al. 1967, Lambert 1963, Pimsleur et al. 1962a, Rivers 1964, Wardhaugh 1967). According to Nida's (1957-1958) experience with intelligent missionary students who had special difficulties in learning a foreign language, learning can be prevented by the fact that the student is afraid of being laughed at or losing his authority, when making mistakes, while he is speaking a foreign language or learning to speak it. In Nida's opinion in the teaching of foreign languages too much attention is paid to such outside factors as the teacher, the teaching method, and the length of the time of study, and too little attention is paid to the personality traits of the student. Of different personality traits extraversion-introversion has been the center of greatest interest. According to Hall's (Haugen 1961) experience extraverts have more difficulties in learning a foreign language than introverts. On the other hand it has been pointed out that the

personality trait in question might not be very relevant as far as foreign language learning is concerned, because it is always connected with a certain linguistic and cultural milieu. A person who is e.g. the soul of a company may be shy and retiring in the company of foreign speaking people (Nida 1956-1957).

2. Some Previous Studies of Personality and Foreign Language Learning

In most previous studies some criteria have been used to divide students into high and low achievers and then these two groups have been contrasted on some personality trait.

Wittenborn et al. (1954) designed a study to evaluate study habits of foreign language university students. In addition to items measuring study habits high and low achievers differed also on the following personality traits: ability to concentrate, anxiety and self-confidence.

Dunkel (1947) advanced the hypothesis that compulsive students would get higher scores in a Latin placement test, however, those students who could be ranked as compulsive, did not get higher scores consistently. Next he contrasted students who received higher scores than expected on the placement test, with those whose scores were lower than expected. He found that there were three kinds of students in

the high-achieving group: compulsively oriented, well-adjusted and maladjusted. He concluded that some rigidity may be good for language learning, but, if there is too much control, it will bring about ineffectiveness. A study of Latin may not seem very relevant among the studies of modern foreign languages. It was, however, assumed that reading comprehension is a similar process no matter what the language, so results of a study of a dead language might be useful for a study of a modern language as far as reading comprehension is concerned.

Pimsleur et al. (1964) compared under-achieving High School foreign language students with average-achievers also on personality traits. Social conformity, willingness to get up and talk before others, flexibility and tolerance for ambiguity and frustration were some of the characteristics that a successful foreign language student was assumed to have. The study did not, however, yield any positive results. According to the investigators this may partly be due to the age of the subjects. With adult students the results might have been different. Another reason may be the fact that teachers mainly judge student achievement on the basis of written work, if the courses were really audio-lingual, they might involve personality factors. It can also be remembered that, if students find the courses very difficult or unpleasant they can always drop out, unlike in our country, where students must go on studying foreign languages

all through secondary school.

Smart et al. (1970) contrasted high, average and low achieving university students on personality straits. High achievers received significantly lower scores on the social spontaneity-scale than the others, which suggests the introversive tendencies of these students.

The design of the last two studies is different from that of the studies previously referred to. The relationship between personality traits and foreign language skills has been investigated in the whole group of subjects, not only in high and low achieving groups.

Pritchard (1952) found a correlation of .72 between sociability, and oral Frech fluency. Sociability was measured by observing the behaviour of grammar school boys during breaks. E.g. Joining a game or starting a conversation were considered evidence of sociability. Oral French fluency consisted of the time subjects spoke intelligible French in answer to simple questions.

Konttinen (1970) studied the relationships of neuroticism, social extraversion and impulsivity to the English language skills of university students. He found four significant correlations between the above mentioned traits, which were based on Eysenck's theory of personality, and thirty-two different measures of foreign language skills.

3. Summary of Previous Studies of Personality and Foreign Language Learning

There have been hardly any positive findings in the studies of personality and foreign language learning; the field has not been systematically investigated. The studies referred to previously differ greatly from one another in many respects. For instance the relationship of one intuitively selected personality trait to one criterion of foreign language skill has been studied. If there have been more measures of foreign language skill, the measurement of personality has still been limited to two or three very general traits. On the other hand there may have been many measures of personality, but few criteria of foreign language skill. The instruments used have also been very much different. Their construction has rather been guided by intuition and speculation than theory; e.g. In a study (Wittenborn et al. 1945) of the 107 items in the questionnaire, one item was considered to measure anxiety. Little information is available on the reliability and validity of the instruments and the generalizability of the results is further limited by the small number of subjects especially in the studies where high and low achievers have been compared. The subjects in the majority of studies have been university students; so there may have been selection even as to personality traits.

4. Some Previous Studies of Intelligence and Foreign Language Learning

Defining intelligence has proved to be a problem and a question has been raised as to the usefulness of different definitions of intelligence (McNemar 1966). In this study intelligence is defined operationally; so it means the scores of the intelligence tests to be mentioned later. The terms intelligence and ability are used as synonyms.

Studies of intelligence and foreign language learning have either been correlative, predictive or factoranalytic.

Correlative Studies

According to American studies carried out in the years 1938-1959 correlations between intelligence (Otis, Henmon-Nelson) and foreign language achievement have ranged from .21 to .65. Verbal ability in the native language correlates also positively (.18 - .59) with grades in the foreign language, but correlations vary a great deal depending on the language studied. There is also variation in the correlations depending on whether the course is an elementary one or a more advanced one (Pimsleur et al. 1962b).

In Finnish studies, however, according to Konttinen (1970) the correlations of intelligence and verbal ability in one's native language to foreign language achievement have been lower than in foreign studies. In Konttinen's opinion the

differences between the measures and curricula do not account for the fact; he thinks that the reason could be the motivating effect of our school leaving examination, which covers the effects of differences in ability. On the other hand in foreign studies, too, there may be effects of such motivational factors as in ours (e.g. entering a college in the USA). The most obvious reason would seem to be the fact that Finnish is not related to the foreign languages which are taught in our schools and the majority of foreign studies deal with languages that are related.

Predictive Studies

Many studies have shown that general intelligence is a poor predictor of success in foreign language learning (e.g. Wittich von 1962, Kangas et al. 1965). Verbal Intelligence has instead proved to be a better predictor. In a study of achievement in college French Courses (Pimsleur et al. 1962a) Verbal Intelligence (consisting of verbal and reasoning elements) and Motivation were the best predictors. The same variables were also the best to predict High School Spanish achievement, while High School French prediction was best accomplished by Verbal Intelligence and by either Word Fluency, or Chinese Pitch Discrimination depending on the goal. Word Fluency was better for the reading-writing goal and Pitch Discrimination for the aural goal (Pimsleur 1963).

Bradley et al. (1967) tried to predict achievement in Spanish,

French and German at university level. The proportion of Spanish achievement explained by Verbal Ability and English was 27.5 percent. The best predictors of French achievement were the Total of Verbal and Quantitative Ability and English and the proportion of variance explained 36.5 percent. The proportion of variance of German achievement explained by the Total and English was only 7.4 percent. The investigators referred to the importance of personal and emotional variables in foreign language learning.

Konttinen (1970) found that verbal comprehension only predicted improvement in reading comprehension during the teaching of English at university level.

Factor-analytic Studies

Wittenborn et al. (1944) designed a factor-analytic study to observe interrelationships between measures of language aptitude, intelligence and second-year college German achievement. The investigators isolated five factors, the interpretation of which proved, however, difficult. A great deal of the variance common to language-aptitude measures was related to intelligence not to German achievement.

In his study of foreign language aptitude Carroll (1958) isolated the following six factors: Verbal Knowledge, Linguistic Interest, Associative Memory, Sound-Symbol Association, Inductive Language-Learning Ability and Grammatical Sensitivity. The only criterion, grades in a five-day course

of Mandarin Chinese received appreciable loadings on the following factors: Linguistic Interest, Associative Memory and Inductive Language-Learning Ability, which according to the investigator play a significant role in foreign language learning. Since there was only one criterion we do not know what the importance of the factors is in learning different foreign language skills.

In the first factor-analysis carried out by Pimsleur et al. (1962a) to investigate "talent for languages" the criteria (French Speaking, French Final Grades) formed a factor of their own. The same happened in the latter part of the study; all the criteria (Cooperative French Test, Lab Oral Grades and Aural Test) received substantial loadings only on the first factor and none on the other seven factors isolated in that study, too.

In many studies there have been 1-3 rather global measures of foreign language skills as criteria. In the next study (Gardner et al. 1965) foreign language skills have been measured from many points of view. The purpose was to find out what different foreign language skills are related to specific intellectual variables. Of the seven factors extracted four were clear and interpretable. They consisted of French achievement variables, and each had loadings from different intellectual variables indicating that different dimensions of foreign language skills are related to different intellectual abilities. The four factors were Linguistic

Reasoning, French Vocabulary Knowledge, School French Achievement and Oral French Reading Skill. When interpreting the factors the investigators drew the following tentative conclusions: verbal reasoning is related to foreign language achievement especially when it is measured by student's a ability to recognize linguistic material; ability to learn auditory material (phonetic coding) helps one to learn vocabulary, so the ability is not specific to oral-aural skills; knowledge of the grammatical distinctions in one's native language will help the student to do well in foreign language courses where grammar is emphasized; reading aloud fluently in a foreign language requires both memory and auditory alertness.

The results in Löfgren's study (1969) showed also the relationship between reasoning and student's ability to recognize linguistic material.

5. Summary of Previous Studies of Intelligence and Foreign Language Learning

Most studies of intelligence and foreign language learning have been carried out in English-speaking countries. The subjects have mainly been adults. Both the so-called general intelligence and verbal ability have been found to be to some extent related to second language achievement. The

former has been found to be a poor predictor of success in foreign language learning; better predictions have been made by means of the latter. It has been found that different foreign language skills are related to different abilities.

Very few studies of foreign language achievement have been carried out in our country; there are none available concerning English achievements in senior secondary schools. The Vocational Guidance Office has information of correlations between intelligence tests and teacher-assigned marks in all school subjects. Very little specific information concerning the English language can be got from these correlations, because, among other things, they have been computed between second language grades and intelligence tests, and the second language can be English or German (or even Russian or French). The results of foreign language studies cannot be generalized to concern the relationships of different English language skills of Finnish school-children to different abilities especially, if ability means native language verbal ability.

III RESEARCH DESIGN AND PROBLEMS

Since the area of foreign language learning and achievement is practically unexplored in our country and since, as a result of our mother tongue belonging to another group of languages than those studied in our schools, the conditions in which foreign languages are studied here are so much different from those in the countries where the majority of studies of foreign language learning have been carried out, this study is considered to be an exploratory field study. The purpose of an exploratory field study is discovering significant variables in the field situation, discovering relationships between variables and laying a foundation for later more systematic testing of hypothesis (Kerlinger 1969), which is what this study aims at. The problems of the present part of the study are the following:

1. What personality variables are related to English school achievements?
2. What intelligence variables are related to English school achievements?
3. By means of what personality and intelligence variables can the variance of English school achievements be best explained?

IV VARIABLES

1. English School Achievements

The instruments used were renewed versions of tests developed for an earlier study (Leino 1970) there being no standardized foreign language achievement tests available for senior secondary school in Finland. The number of items of all the tests were increased, because the reliabilities had remained rather low. Because there was reason to believe that the text of the Reading Comprehension Test might be familiar to students, a new one was developed on the basis of a test used in England (University of Cambridge, Local Examinations Syndicate 1964-1968, 60-61). The new items of the Listening Comprehension Test (I) are mainly based on Mai Stenberg's ideas. Listening Comprehension was also tested with the last part of a test developed by the School Leaving Examination Board. The test measures reading comprehension, too, since the multiple-choice questions were given in writing. Students' ability to express ideas in writing was tested with a Dialogue Test developed by Mrs. Varmavuori, M.A. This type of test was resorted to, because it was assumed that it would be more objective to score than an

essay test. This test also measures reading comprehension since the words of the other person are given.

The variables are the following:

1. Recognition of Sounds
2. Production of Sounds
3. Production of Stress
4. Recognition of Grammatical Structures
5. Production of Grammatical Structures
6. Recognition of Vocabulary
7. Recognition of Idioms
8. Production of Vocabulary
9. Spelling
10. Reading Comprehension
11. Listening Comprehension (I)
12. Listening Comprehension (II)
13. Translation
14. Written Production

These instruments and their instructions can be found in the Institute of Education, University of Helsinki, Finland.

Testing oral production has proved to be a problem. Löfgren (1969) tried to find out empirically, whether it would be possible to evaluate a person's ability to speak a foreign language without having to make him speak it, but the results of his study did not, however, give a definite solution to the problem. Robinson (1971a) thinks that the most difficult problem is not how to score oral production objectively but how to create a motivating speaking situation. There are many opinions of what different parts an oral pro-

duction test should consist of and how to score them (e.g. Kalivoda 1970, Lado 1967, Otter 1968, Perren 1968, Robinson 1971b).

Testing oral production is such a complex problem that trying to solve it would require a research design of its own. In this study an evaluation of students' oral ability given by the teacher had to be resorted to. The evaluation was done in the same way as previously (Leino 1970). Also other grades given by the teacher were included as criterion variables.

The teacher-assigned variables are the following:

15. Evaluation of Speaking Ability
16. Grammar Test
17. Translation Test
18. Final Spring Semester Grade

2. Personality

Cattell's 16PF/A was selected to be the instrument for the measurement of personality, because it is one of the most comprehensive systems for describing personality (Pervin 1970, Sells 1969, Tapaninen 1966). As the studies previously referred to showed, there have been hardly any positive findings concerning personality and foreign language achievement. One possible reason might be the fact that very few

personality variables have been included in them. 16PF/A measures the following traits:

19. Factor A: Cyclothymia-Schizothymia
20. Factor B: General Intelligence-Mental Defect
21. Factor C: Emotional Stability-Dissatisfied Emotionality
22. Factor E: Dominance-Submission
23. Factor F: Surgency-Desurgency
24. Factor G: Super-ego Strength-Lack of Rigid Internal Standards
25. Factor H: Parmia-Threctia
26. Factor I: Premsia-Harria
27. Factor L: Protension-Relaxed Security
28. Factor M: Autia-Praxernia
29. Factor N: Shrewdness-Naivité
30. Factor O: Guilt Proneness-Confident Adequacy
31. Factor Q1: Radicalism-Conservatism
32. Factor Q2: Self-Sufficiency-Group Dependancy
33. Factor Q3: High Self-Sentiment Formation-Poor Self-Sentiment formation
34. Factor Q4: High Ergic Tension-Low Ergic Tension

The traits are described in the manual (Cattell et al. 1957). The retest reabilities of the traits vary between .63 - .88 and the construct validities between .73 - .96 (Cattell 1965).

3. Intelligence

Tests developed in The Vocational Guidance Office were used for measuring intelligence. Such tests were selected which could, on the basis of experience and previous studies, be assumed to be relevant from the point of view of foreign

language learning.

The intelligence variables are the following:

35. R1/Ab, a test of analogy measuring verbal reasoning.
36. V1/Ab, Ebbinghaus, which measures both vocabulary and fluency.
37. V9/0, artificial language, which measures foreign language learning ability by means of understanding verbal structures.
38. V12/0, a test of words in international use; it is assumed that a student who easily learns words which are in international use will also learn foreign languages easily. The test is also considered to give a measure of linguistic interest.
39. WM/0, a test of word memory.

The reliabilities of the tests vary between .78 - .96. On the basis of the results of previous studies (Payne et al. 1967, Smart et al. 1970) the intention was to include some measure of mathematical ability. It had to be given up, however, on account of lack of time that was available for administering all the tests. On the other hand there are also numerical items in Cattell's Factor B, which is meant to give a quick estimate of a person's general intelligence, when no other measure is available (Cattell 1957).

V SUBJECTS AND DATA COLLECTION

Subjects

Sixty-four (29 boys, 35 girls) seventh grade students of Munkkivuori Secondary School acted as subjects. They had all completed an average of about six years of formal training in English. The selection of the sample of students was guided by the practical consideration that the present writer was a teacher of English in that school. It would seem to be impossible to select students, using some kind of sampling method, for this kind of extensive study, whose data collection takes a great deal of time and requires the cooperation of many teachers. The subjects of this study can, however, be considered to represent Finnish senior secondary school students for the following reasons: the results of the school leaving examination are not on the average different from those of other schools; the number of those entering colleges is about the same as in other schools. The fact that about 90 percent of the age group enter Munkkivuori Secondary School might give reason to assume that the students are "weaker" in achievement and ability than in those schools that are more selective. On the other hand the number of grown-ups that have graduated from secondary school

in Munkkivuori is the second greatest of every part of Helsinki (Sweetser 1963).

Data Collection

In order not to disturb the ordinary school work data collection was spread over a long period. It took place during regular school-hours, in the spring term in 1971. Because this was a time-consuming project (about 10 hours per student), it was considered necessary to inform the students in advance about the study, its confidential nature and who the investigator is. It should be mentioned that the present writer has not been the teacher of any of the subjects for at least two years. The three English teachers administered part of the school achievement tests in their own respective group; the rest was administered by the writer. Those who were absent on the days of testing were caught later, so there is no missing information.

Data collection for this kind of study involves typical sources of error, the influence of which is beyond control for example students' attitude and interest in the tests, the time of testing etc. Because it was the seventh grade and the spring term, it often happened that one or all of the groups had some examination on the same day as they took the tests of this study. The personality test gives the most reliable results, when it is used for research purposes and when subjects are co-operative and frank (Cattell et al. 1957). The personality test was administered

in all the groups immediately after the sports holidays. According to the investigator's observation the subjects were very much interested in the test and took it seriously. Everybody answered all the 187 questions of the test, and none marked more than one choice of the three choices given to each question, which also proves the co-operativeness of the subjects.

VI HANDLING THE DATA OF THE ENGLISH SCHOOL ACHIEVEMENTS

The computer operations necessary for this work were carried out at the Computing Centre of the University of Helsinki.

Data on the scoring and the item-analyses of the English school achievement tests are to be found in the Institute of Education of the University of Helsinki.

Table 1. Means, Standard Deviations and Coefficients of Reliability of the English School Achievement Tests. Testing Time (min).

	Mean	S.D.	Kuder-Richadson Reliability	Testing Time
1.	7.36	1.40	.01	10
2.	4.50	2.31	.45	10
3.	8.84	3.39	.64	10
4.	6.23	2.10	.35	15
5.	9.89	2.62	.48	15
6.	9.56	3.24	.51	15
7.	6.83	2.47	.57	10
8.	13.17	6.37	.07	15
9.	4.39	2.31	.60	10
10.	5.13	2.35	.49	20
11.	11.86	2.62	.37	10
12.	6.39	2.14	.55	30
13.	20.05	6.19		30
14.	17.58	4.73		30
15.	3.02	1.06		
16.	4.83	2.44		
17.	4.16	2.44		
18.	5.63	1.64		

The Kuder-Richardson procedure could not be used for estimating the reliability of Translation. The test was objective to score, so it was not considered necessary to compute rater reliability, which was done with Written Production. The Pearson Coefficient of Correlation between the scores given by two independent raters was .94. The communalities of the tests can also be regarded as estimates of reliability. They are presented in Table 2 (Appendix 2). Recognition of Sounds was discarded from further analyses.

The only criteria available for estimating the validity of the tests are the marks assigned by the teacher. Special difficulties connected with the use of them as validating instruments of foreign language achievement tests have been discussed earlier (Leino 1970). The intercorrelations of all the English school achievement variables are presented in Table 2 on the next page. It can be stated generally that, with the exception of the first variable, which was discarded from further analyses, all the correlations between test variables and teacher-assigned marks are significant.

Table 2. Intercorrelation Matrix of the English School Achievement Variables (N=64)

.24																	2
.07	.56																3
-.09	.36	.23						Level of significance									4
.02	.37	.29	.40						0.5	.24							5
.17	.57	.52	.40	.35					0.2	.29							6
.00	.30	.14	.15	.19	.44				0.1	.31							7
.06	.55	.42	.57	.42	.73	.55											8
.09	.55	.36	.47	.46	.47	.31	.63										9
.17	.46	.26	.48	.40	.55	.47	.66	.55									10
.11	.34	.26	.15	.23	.34	.35	.33	.25	.36								11
.08	.45	.18	.39	.40	.39	.61	.46	.39	.51	.35							12
.10	.66	.48	.53	.51	.57	.42	.77	.74	.68	.36	.50						13
.17	.21	.01	.34	.26	.28	.27	.41	.38	.51	.07	.39	.48					14
.01	.36	.42	.33	.37	.53	.36	.57	.44	.43	.39	.42	.55	.22				15
.12	.61	.50	.50	.50	.42	.26	.60	.66	.49	.32	.40	.74	.32	.47			16
.09	.55	.46	.46	.48	.65	.61	.76	.61	.65	.36	.55	.72	.42	.70	.59		17
.15	.61	.51	.50	.53	.66	.52	.79	.71	.62	.37	.53	.81	.46	.68	.84	.85	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1. Factor Analyses

Factor analysis was employed to reduce the number of the English school achievement variables for further analysis. The unrotated factor matrix is presented in Appendix 1 (Table 1). The first factor accounted for about 47 percent of the variance of the variables and 74 percent of the total variance, which refers to the unity of the English school achievements as measured by the instruments developed for this study and marks assigned by the teacher. The Varimax-rotated factor matrix is presented in Appendix 2 (Table 2). The factors could not be interpreted, because most variables had substantial loadings on all the factors. Another method of rotation was employed, too, but it did not offer a clearer solution either. (Data on this analysis are available in the Institute of Education of the University of Helsinki).

There are two assumptions that can be made on the basis of the factor analyses. One is that the English school achievements are as unified as the factor analyses seem to indicate. This assumption is supported by the fact that the teaching of the first foreign language offers very limited possibilities for the practice of all foreign language skills. This is mainly due to the compulsory school-leaving examination of foreign languages, in which the only language skill that is tested is translation. The recently modernized version

of the test, which includes an essay test among other things, consists mainly of translation, too, and has not become very popular, students being able to choose which form of the test they want to take. It must also be remembered that it was not until a year ago that the old objectives of foreign language teaching were renewed. The new objectives (Valtion oppikoulujen opetussuunnitelmat: Nykykielet, 1971) emphasize the practice of all language skills (listening, speaking, reading and writing). According to these objectives translation exercises are not necessary in senior secondary school. Still, the following statement is to be found "as long as translation is included in the school-leaving examination, it must be practised in senior secondary school" (p41).

The other assumption concerns instruments. With a sufficiently large battery of English school achievement tests having high reliability and validity it might be possible to extract (easily)interpretable factors, the factor scores of which could be used as basis for further analysis. The reliabilities of some of the instruments was rather low; the problem of validity could not be satisfactorily solved and the number of variables was too small to be successfully used in factor analysis.

In order to find out by means of what personality and intelligence variables (and motivational and auditory variables in the continuation study) the variance of English school

achievements can best be explained a general dimension of English school achievements was formed on the basis of the factor scores of the first factor of the principal axes solution in Table 1 (Appendix 1). The number of this English school achievement variable is 49.

VII RELATIONSHIPS OF PERSONALITY AND INTELLIGENCE VARIABLES TO ENGLISH SCHOOL ACHIEVEMENTS

1. Relationships at the Correlation Level

The scoring of the intelligence tests was done in The Vocational Guidance Office. The means, standard deviations and intercorrelations of the personality and intelligence variables are presented in Table 3 (Appendix 3).

The correlations between the English school achievement variables and personality variables are presented in Table 3 on the next page.

Table 3. Correlation Matrix, English School Achievement and Personality Variables (N=64)

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
2	-.13	.26	-.16	-.20	-.13	.14	-.44	.06	-.20	-.20	.16	.00	.14	.18	.02	-.08
3	-.05	.22	-.06	-.03	.03	.05	-.07	-.14	-.19	-.23	.11	-.14	-.07	.05	.11	-.12
4	.00	.30	-.20	-.12	.08	.02	-.21	-.07	-.20	.02	.05	.05	.00	-.02	-.03	.12
5	-.12	.27	-.16	.16	.15	.21	-.18	-.08	.01	-.06	.24	.05	.05	-.12	-.11	.17
6	-.11	.20	.03	-.12	-.08	.07	-.10	-.03	-.36	-.28	.12	-.12	.20	.15	.32	-.23
7	-.14	.09	-.12	.05	-.09	.00	-.26	.05	-.04	-.22	.21	.02	.33	.09	.10	-.03
8	-.07	.25	-.19	-.13	-.02	.02	-.19	.08	-.27	-.27	.19	.00	.16	.14	.22	.00
9	-.25	.34	-.16	-.19	.05	.22	-.26	.00	-.05	.15	.10	.06	.10	.08	.09	-.02
10	.04	.27	-.22	.00	.04	.15	-.23	-.06	-.10	-.33	.25	.09	.04	-.04	-.08	.10
11	.10	-.03	.03	-.07	-.07	-.02	-.04	-.16	-.04	-.09	.15	-.10	.10	.06	.08	-.10
12	-.06	.15	-.22	.00	-.05	-.04	-.26	.13	-.08	-.14	.07	.12	.16	.06	-.08	.03
13	-.07	.20	-.29	-.20	-.09	.17	-.32	.11	-.18	.23	.20	.13	.13	.11	.00	.06
14	-.15	.11	-.21	-.15	-.05	.14	-.15	.23	-.17	-.02	.15	.16	.06	.06	.04	.20
15	.00	.04	-.06	.02	-.05	-.05	.08	.00	-.15	-.17	.26	-.08	.02	-.01	.02	-.11
16	-.14	.12	-.20	-.10	-.12	.28	.35	.03	.01	-.06	.16	.13	-.03	.14	-.03	.00
17	-.10	.28	-.16	.07	.03	.03	-.18	-.06	-.12	-.22	.24	-.09	.09	-.05	.04	-.08
18	-.13	.21	-.24	-.06	-.08	.22	-.28	.10	-.11	-.17	.23	.08	.12	.10	.08	-.03

Level of significance	.05	.24
	.02	.29
	.01	.31

It can be seen that the correlations between the English school achievement variables and personality variables are generally rather low. Six personality variables have no significant correlations to any school achievement variable. These variables are Dominance-Submission, Surgency-Desurgency, Premsia-Harria, Guilt-Proneness-Confident Adequacy, Self-Sufficiency-Group Dependancy, High Ergic Tension-Low Ergic Tension. The English school achievement variables that do not correlate significantly with any personality variables are Production of Stress, Listening Comprehension (1) and Written Production.

The personality variables that had the greatest number of significant correlations were Factors B: General Intelligence-Mental Defect and H: Parmia-Threctia. The correlations of Factor B to the other intelligence variables ranged from .01 to .32. The significant correlations of Factor H are negative with the exception of the correlation to variable 16. This could be explained in the following way. Such student characteristics as conscientiousness and carefulness are connected with success in the English school achievement tests, which were all literal. The same characteristics are connected with Final Spring Semester Grade. The fact that Factor H correlates positively to The Grammar Test, refers to the possibility that it reflects such student characteristics as friendliness and activity during the lessons. According to this explanation they do not influence Final Spring Semester Grade, because the teacher uses more de-

liberation in assigning it on account of its "decisiveness".

Table 4. Correlation Matrix, English School Achievement and Intelligence Variables (N=64)

	35	36	37	38	39	
2	.52	.17	.33	.45	.41	Level of significance
3	.24	.13	.23	.20	.13	.05 .24
4	.23	.31	.21	.07	.29	.02 .29
5	.47	.18	.37	.16	.25	.01 .31
6	.42	.24	.33	.32	.17	
7	.32	.14	.20	.45	.10	
8	.41	.32	.37	.35	.30	
9	.53	.28	.40	.44	.48	
10	.53	.37	.42	.42	.33	
11	.26	.11	.06	.28	-.06	
12	.40	.23	.13	.42	.23	
13	.53	.33	.47	.47	.49	
14	.37	.47	.42	.22	.41	
15	.29	.24	.18	.42	.04	
16	.48	.15	.38	.30	.51	
17	.49	.30	.33	.53	.16	
18	.52	.28	.43	.45	.38	

The great majority of the correlations between the foreign language achievement and intelligence variables were significant. Differing from the results of some previous studies (Gardner et al. 1965, Löfgren 1969), reasoning (variable 35) was related to all achievement variables except one, and not particularly to those measuring students' ability to recognize linguistic material. In fact the one school achieve-

ment variable that did not correlate significantly with reasoning was of recognition type. The English school achievement variables whose all correlations to intelligence variables were significant were Production of Vocabulary, Spelling, Reading Comprehension, Translation and Final Spring Semester Grade. Production of Stress and the following recognition type of tests, Recognition of Grammatical Structures, Recognition of Idioms and Listening Comprehension I and II had the greatest number of non-significant correlations. Since those variables have also very few correlations with Personality Variables, it would be reasonable to assume that part of their variance could be explained in terms of motivational, or auditory variables to be dealt with in the continuation study.

2. Relationships at the Factor Level

In order to find out, which of the personality and Intelligence variables are the best predictors of the English school achievements, a stepwise multiple regression analysis was carried out with variable 49, the general dimension of the English school achievements, as criterion and personality and intelligence variables as predictors.

Table 5. Correlation Matrix, General Dimension of the English School Achievements and Personality Variables (N=64)

	19	20	21	22	23	24	25	26
Variable 49	-.12	.28	-.22	-.10	-.04	.14	-.30	.02

	27	28	29	30	31	32	33	34
Variable 49	-.18	-.24	.24	.04	.13	.09	.07	-.01

Table 6. Correlation Matrix, General Dimension of the English School Achievements and Intelligence Variables (N=64)

	35	36	37	38	39	Level of significance	
Variable 49	.59	.35	.45	.50	.40	0.5	.24
						0.2	.29
						0.1	.31

Table 7. Stepwise Multiple Regression Analysis with General Dimension of the English School Achievements as Criterion and Personality and Intelligence Variables as Predictors (N=64)

Predictors	Standardized Regression Coefficients					
	1	2	3	4	5	6
35 R1/Ab	.59	.47	.49	.41	.38	.32
38 V12/0		.32	.30	.30	.30	.32
27 Factor L			-.19	-.19	-.26	-.34
39 WM1/0				.20	.19	.24
21 Factor C					-.19	-.26
26 Factor I						-.18
Constant	360.04	268.04	356.15	337.77	431.58	534.29
R^2	.35	.44	.47	.51	.54	.56

Only those variables that gave a significant increase in the proportion of variance accounted for are presented in the table. As can be seen the variance of the English school achievements as measured by the tests developed for this study and marks assigned by the teacher was best explained by a reasoning type of verbal ability. The proportion of variance accounted for by this variable was 35 percent. The next biggest contribution (9 percent) was given by V12/0, a test of words in international use, which is also considered to measure linguistic interest. The correlation between the best predictors is .39. The last four variables in the model gave the following increases in the proportion of variance accounted for: Factor L: Protension-Relaxed Security 3 percent, WM1/0 4 percent, Factor C: Emotional Stability-Dissatisfied Emotionality 3 percent and Factor I: Premsia-Harria 2 percent.

Since the predictors or the independent variables of the present study are what Kerlinger (1969) calls assigned variables (variables that cannot be manipulated), there are few recommendations that can be inferred from the results of the analyses. Those that can be inferred concern the intelligence variables. Word Memory accounts for the variance of the English school achievements to some extent. In the English language there are undoubtedly some skills the learning of which is facilitated by word-memory or maybe even rote-memory. Learning the principal parts of irregular verbs might need this kind of memory. The proportion of variance accounted for by means of Word Memory is, however, smaller than that accounted

for by means of Reasoning. This is important from the point of view of the teaching and testing of English and the study habits of students.

Thinking of the methods of teaching it would seem obvious that new words should be taught in context, so that learning them could be facilitated by a reasoning type of verbal ability. Evidently this is most important in the teaching of English which is characterized by a large vocabulary and a great number of so-called synonyms. The recommendation given in the plans for our reformed school system (Mietintö 1970 II A 5) which consists of sometimes practising new words so that pupils read them in chorus from word lists is not well-founded. It would be necessary to study the relationships of reasoning and word memory to English school achievements in junior secondary school, where grammar is taught by means of pattern practice and the problem is whether to give explanations concerning the structures or not. It has been impossible to solve the problem on the basis of the results of previous studies on teaching methods (Levin 1969, Lindblad 1970). If memory were the best predictor, explanations would seem unnecessary. On the other hand, if reasoning were found to predict English school achievements best, explanations could be considered necessary, because there are always those students who cannot reason the underlying principle or rule of the structures themselves.

Thinking of different types of language tests it is not advisable to test students' knowledge of vocabulary by giving them lists of isolated words, since then pupils will have to depend mainly on memory. The number of these traditional vocabulary tests is now limited, which is due to foreign language teachers' decision to limit the number of tests for reasons other than their pedagogic unsuitability.

From the point of view of the study habits of students it would be advisable to study new words in context and not from the list of words given at the back of the book.

As for the personality variables in the model, it can be stated that Relaxed Security and Dissatisfied Emotionality are related to English school achievements. It seems natural that such student characteristics as acceptance and trustfulness (by which qualities Relaxed Security is described) should be related to foreign language achievement at least as long as activities in language are teacher-controlled. The emergence of Dissatisfied Emotionality is harder to explain unless it could be interpreted as students' willingness to be easily influenced. None of the correlations of Factor I to English school achievement variables were significant and its correlation to the general dimension of English school achievements was practically zero. Its emergence in the model must be attributed to chance due to the small sample.

VIII DISCUSSION

The use of regression analysis was based on the assumption of linearity. The generalizability of the results is restricted, among other things, by the small sample; when regression analysis is employed the number of subjects should be at least two or three times as big as the number of variables (Kulokari 1970). Of the personality variables only Relaxed Security was related to English school achievements at the factor level to any appreciable extent. It would seem reasonable to assume that personality variables play a minor role in foreign language learning in situations where activities are teacher-controlled, students having few opportunities for independence, responsibility, and initiative. It would be interesting to investigate the relationships of personality variables to foreign language achievements, for instance, in non-graded senior secondary school, where students have more freedom to plan their own studies, even though their freedom is also limited by school leaving examination. On the other hand, it should be remembered that, the lack of positive findings with personality variables may be due to the fact that the instruments which are employed for measuring personality are still at a stage of development.

Of the intelligence variables the best predictors were Verbal Reasoning, Linguistic Interest and Word Memory. If we had to develop a test battery for selecting students for further language studies R1/Ah might be suitable as a part of such a battery. Linguistic interest refers to the importance of motivation in foreign language learning and will be further discussed, when the results of the whole study are available.

It is probable that the inclusion of motivational and auditory variables in the final analysis will change the proportions of the variance accounted for by means of personality and intelligence variables. Still, on the basis of the results of the present study, it is possible to draw tentative conclusions as to those personality and intelligence variables whose relationships to English school achievements would be worth exploring on a larger sample.

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APPENDICES

Appendix 1.

Table 1. Unrotated Factor Matrix (N=64)

	I	II	III	IV	V
(1	.14	.03	.03	-.47	.00)
2	.70	.27	.09	-.30	-.05
3	.53	.46	.28	-.00	.05
4	.58	.02	-.33	.22	.13
5	.57	.09	-.18	.15	-.13
6	.74	.04	.27	-.08	.33
7	.56	-.48	.29	-.01	-.10
8	.86	-.07	.02	.07	.26
9	.76	.13	-.25	-.03	-.02
10	.74	-.25	-.12	-.14	.09
11	.44	-.04	.29	-.06	-.22
12	.63	-.36	.04	-.04	-.27
13	.88	.08	-.16	-.04	-.01
14	.48	-.33	-.37	-.16	.09
15	.68	.01	.27	.30	-.03
16	.78	.34	-.21	.01	-.23
17	.88	-.13	.14	.12	.05
18	.93	.06	-.01	.04	-.05
Eigenvalues	8.43	0.98	0.84	0.55	0.43
Eigenvalues as a percentage of the number of variables	46.8	5.4	4.7	3.1	2.4

Appendix 2.

Table 2. Varimax-rotated Factor Matrix (N=64)

	I	II	III	h^2
(1	.12	-.06	-.06	.02)
2	.63	-.22	-.35	.57
3	.75	-.08	-.09	.57
4	.21	-.13	-.62	.45
5	.32	-.15	-.49	.36
6	.57	-.48	-.25	.62
7	.11	-.76	-.16	.62
8	.45	-.61	-.53	.74
9	.43	-.18	-.65	.64
10	.21	-.50	-.67	.62
11	.35	-.40	-.05	.28
12	.13	-.60	-.38	.52
13	.50	-.33	-.67	.81
14	-.10	-.31	-.60	.47
15	.52	-.47	-.21	.53
16	.60	-.07	-.63	.76
17	.48	-.61	-.45	.81
18	.58	-.43	-.58	.87
Eigenvalues	3.49	2.95	3.81	10.2
Eigenvalues as a percentage of the number of variables	19.2	16.2	21.2	56.6

Table 3. Means, Standard Deviations and Intercorrelations of the Personality and Intelligence Variables (N=64)

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	Mean	S.D.
19																						11.25	3.32
20	-.02																					9.16	2.09
21	.06	-.05																				13.33	4.44
22	.21	-.03	.17																			13.73	4.34
23	.34	.33	.26	.34																		15.55	4.50
24	.07	.04	.09	.03	-.06																	10.83	3.43
25	.34	-.07	.58	.41	.52	-.07																10.20	5.23
26	-.12	-.07	-.23	-.18	-.10	.02	.00															9.89	3.31
27	-.12	-.17	-.35	.23	-.12	.00	-.30	-.31														11.02	2.53
28	-.23	-.15	-.15	.02	-.16	.00	-.07	.02	.15													13.67	3.72
29	.08	.12	.03	.34	.08	.29	.02	-.33	.15	-.11												11.05	2.73
30	.02	-.15	-.55	-.16	-.30	.10	-.39	.33	.28	.11	-.15											14.28	4.72
31	-.18	.02	.03	.12	-.09	.04	.03	.21	-.13	.03	.12	-.1										10.70	2.66
32	-.20	.00	-.10	-.44	-.46	.02	-.44	.00	-.10	.23	.00	.35	.03									10.80	3.55
33	-.10	.09	.47	-.04	.05	.02	.28	-.03	-.48	-.07	.07	-.41	.34	.25								10.50	2.35
34	.09	.02	-.58	-.05	-.17	-.01	-.2	.16	.38	.11	.06	.74	-.35	-.07	-.52							14.45	4.76
35	-.38	.32	-.21	-.11	-.0	.15	-.16	-.17	.1	-.17	.01	.16	.13	.01	.20	-.04						21.36	9.06
36	-.09	.20	.05	-.06	.08	.12	.07	.01	-.15	-.40	.25	-.27	.09	.02	.10	-.02	.29					14.22	6.31
37	-.22	.23	-.06	-.11	.08	.27	-.19	.14	-.19	-.13	.22	-.04	.13	.25	.09	-.02	.52	.53				22.37	13.54
38	-.20	.19	-.36	.26	-.09	.07	-.13	.20	-.1	-.11	.13	-.21	.36	.26	.14	-.20	.78	.34	.35			24.48	6.43
39	-.29	.01	-.15	-.16	-.07	.01	.33	.5	.16	-.15	.25	-.20	.05	.13	-.14	.03	.45	.30	.20	.14		22.17	11.77

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